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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,445	03/30/2004	Hong Zhong	124932-1	5441

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
RONESI, VICKEY M	

ART UNIT	PAPER NUMBER
1714	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/814,445	ZHONG, HONG	
	Examiner	Art Unit	
	Vickey Ronesi	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15-22* is/are pending in the application.

4a) Of the above claim(s) *16-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I (claims 1-13 and 15) in the reply filed on 4/25/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 16-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/25/2005. Claims 14 and 23-26 have been cancelled as instructed in the reply filed on 4/25/2005.

Information Disclosure Statement

3. The Information Disclosure Statement (IDS) filed 12/10/2004 has been considered by the examiner. It is noted that US Patent Documents US 2003/0027910 and US 2003/0077478 which were incorrectly cited under "Other Information" have been struck from the IDS and cited by the examiner on Form 892 under the correct heading of "U.S. Patent Documents."

Claim Objections

4. Claims 2, 5, 7, and 8 are objected to because of the following reasons:

With respect to claim 2, the use of the word "and" in "alloys and combinations and mixtures thereof" (emphasis added) suggests that in one embodiment alloys, combinations, and

mixtures thereof are always present together. It is suggested that "and" be replaced with the alternative "or".

With respect to claim 5, the use of the word "and" in "combinations and mixtures thereof" (emphasis added) suggests that in one embodiment combinations and mixtures thereof are always present together. It is suggested that "and" be replaced with the alternative "or".

With respect to claim 7, on line 2 of the claim the word "and" should be replaced with "or" or "and/or." As currently written, the conjunctive word "and" suggests all combinations and mixtures thereof yet in the preceding line the phrase "at least one of" is recited which necessitates the use of alternative language, "or" or "and/or."

With respect to claim 8, the word "comprsises" is misspelled and should read as "comprises".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 1 and 15, the ratio does not specify basis, i.e., is the ratio based weight, volume, etc?

With respect to claims 2-11, they are rejected for being dependent on a rejected claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 4-7, 9-12, and 15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Misra '910 (US 2003/0027910).

Misra '910 discloses a thermally conductive composition comprising low melting indium alloy (paragraph 0024); up to 50 vol % of thermally conductive particulate (paragraphs 0012, 0040, and 0050); a polymer matrix, such as silicone (paragraph 0041); and surface active agents, i.e., adhesion promoter (paragraphs 0028 and 0039), wherein the liquid metal and particulate is present is a combined amount of 10-90 vol % (claim 4).

In light of the above, it is clear that Misra '910 anticipates the presently cited claims.

To the extent that Misra '910 does not exemplify a composition wherein the ratio of liquid metal to particulate filler is in the presently claimed weight ratio range, it is considered that it would have been obvious to one of ordinary skill in the art to utilize effective relative amounts of liquid metal and particulate filler that fall within the disclosed range to obtain desirable thermoconductive properties. Even if it is shown that the range taught in Misra '910 does not overlap the presently claimed range, it is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Should applicant argue criticality of the presently claimed 2:1 ratio, it will be noted that applicants' data have no probative value to support such an assertion.

7. Claims 1-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Misra '116 (US 2003/0187116).

Misra '116 discloses a thermally conductive composition comprising a liquid metal comprising gallium and/or indium (paragraphs 0009, 0041-0046); conductive particulate (paragraphs 0010, 0012, and 0039); a polymer matrix such as silicone acrylics, epoxy which may be crosslinked (paragraph 0008); and silane components, i.e., adhesion promoter (paragraphs 0005 and 0037), wherein the liquid metal and particulate is present is a combined amount of 10-

90 vol % (claim 1). In its limited examples, Misra '116 only exemplifies relative amounts of liquid metal and particulate filler that fall outside the presently claimed ratio range.

Even so, it is considered that it would have been obvious to one of ordinary skill in the art to utilize effective relative amounts of liquid metal and particulate filler to obtain desirable thermoconductive and viscosity properties since the weight ratios are result effective variables because changing them will clearly affect the type of product obtained. See MPEP § 2144.05 (B). Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In particular, note paragraphs 0013-0015 of Misra '116 as evidence that the relative amounts will affect the properties of the end product.

In view of this, it would have been obvious to one of ordinary skill in the art to utilize appropriate relative amounts of liquid metal and particulate filler, including those within the scope of the present claims, so as to produce desired end results. Should applicant argue criticality of the presently claimed ratio range, it will be noted that applicants' data have no probative value to support such an assertion. Absent a showing of unexpected results with appropriate side-by-side examples, it is the examiner's position that such a range as presently claimed is obvious over the teachings of Misra '116.

With respect to claim 13, given that that the polymeric matrix is capable of being crosslinked (i.e., cured) through thermal or radiative activation, it would have been obvious to one of ordinary skill in the art to utilize a catalyst which would be activated upon application of heat or radiation to initiate crosslinking and thereby arrive at claim 13.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Ronesi whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/26/2005
vr

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